

ADDITAMENTA AD FLORAM JORDANICAE¹

BAKI KASAPLIGIL

THE PLANTS DESCRIBED IN THIS PAPER were collected by the author during an assignment in the Hashemite Kingdom of Jordan, during the years 1954 to 1956, as a Forest Ecologist of the Food and Agriculture Organization of the United Nations. Specimens of the new taxa proposed were distributed among the following herbaria: Jubeicha Agricultural College, Jordan; Université Saint Joseph, Beiruth, Lebanon; Conservatoire et Jardin Botaniques, Geneva, Switzerland (G), the University of California, Berkeley, California (UC), and the Arnold Arboretum of Harvard University, Cambridge, Massachusetts (A).

Atriplex asphaltitis sp. nov.

FIGS. 1 and 2.

A. halimus var. *argutidens* Bornm. Mitt. Thür. Bot. Ver. 30: 82. 1913; Post & Dinsmore, Fl. Syr. Palest. & Sinai, ed. 2. 2: 436. 1933; Aellen, Bot. Jahrb. 70: 13. 1940; Eig, Palest. Jour. Bot. 3(3): 124. 1945.

Frutex 1–1.5 m. altus, glaucus, dioicus; folia inferiora 1.5–2 cm. longa, 1–1.5 cm. lata, rhomboidea vel late trullata vel elliptica, apice acuta vel obtusa, basi cuneata vel truncata, margine integra vel sparse dentata, folia superiora triangularis mucronata, margine subintegra, basin versus sparse dentata; glomeruli laxe spiciformes, distincte interrupti, fasciculi diametro 6–8 mm.; bractee fructiferae 4 mm. longae, 7 mm. latae, depresso ovaes vel reniformes, basi auriculatae, margine distincte dentatae, basi solide coniunctae et fructus cingentes, nervi prominuli, sine appendicibus; stylus brevis, 0.25–0.5 mm. longus, stigmata dua 1–1.5 mm. longa, in statu fructifero e bractea cingente leviter exserta; semina diametro 2–2.5 mm., brunnea, radícula sursum curvata; grana pollinis sphaeroidea, multiforata, numerus foraminum 60 (50–72), foramina in superficie granae

¹The present study was carried on during a sabbatical leave from Mills College, Oakland, California, in the academic year 1962–63. I wish to thank Monsieur René Gombault, Attaché au Muséum National d'Histoire Naturelle, Paris, who gave generously of his time to compare my specimens with those of his collections from Syria. I am very grateful to Dr. Haino Heine of the Laboratoire de Phanérogamie of the same institution for the translations of the diagnoses into Latin and to Dr. Rimo Bacigalupi, Curator of the Jepson Herbarium, University of California, Berkeley, California, for reading the manuscript. I appreciate also the generosity of the officials in charge of the collections listed here for making available materials for my study: Laboratoire de Phanérogamie, Muséum National d'Histoire Naturelle, Paris (P); Conservatoire et Jardin Botaniques, Musées de Genève (G); the Herbarium, Royal Botanic Gardens, Kew, Great Britain (K), and Botanischer Garten und Institut für Systematische Botanik der Universität Zürich (Z).



FIG. 1. *Atriplex asphaltitis* Kasapligil. Fruiting branch, $\times 4/10$.

pollinis regulariter dispersa, textura granularis, 24.7 (21.1–29.9) micra diametro.

HOLOTYPE: Kale (or Kallia), south of Jericho and at the north end of the

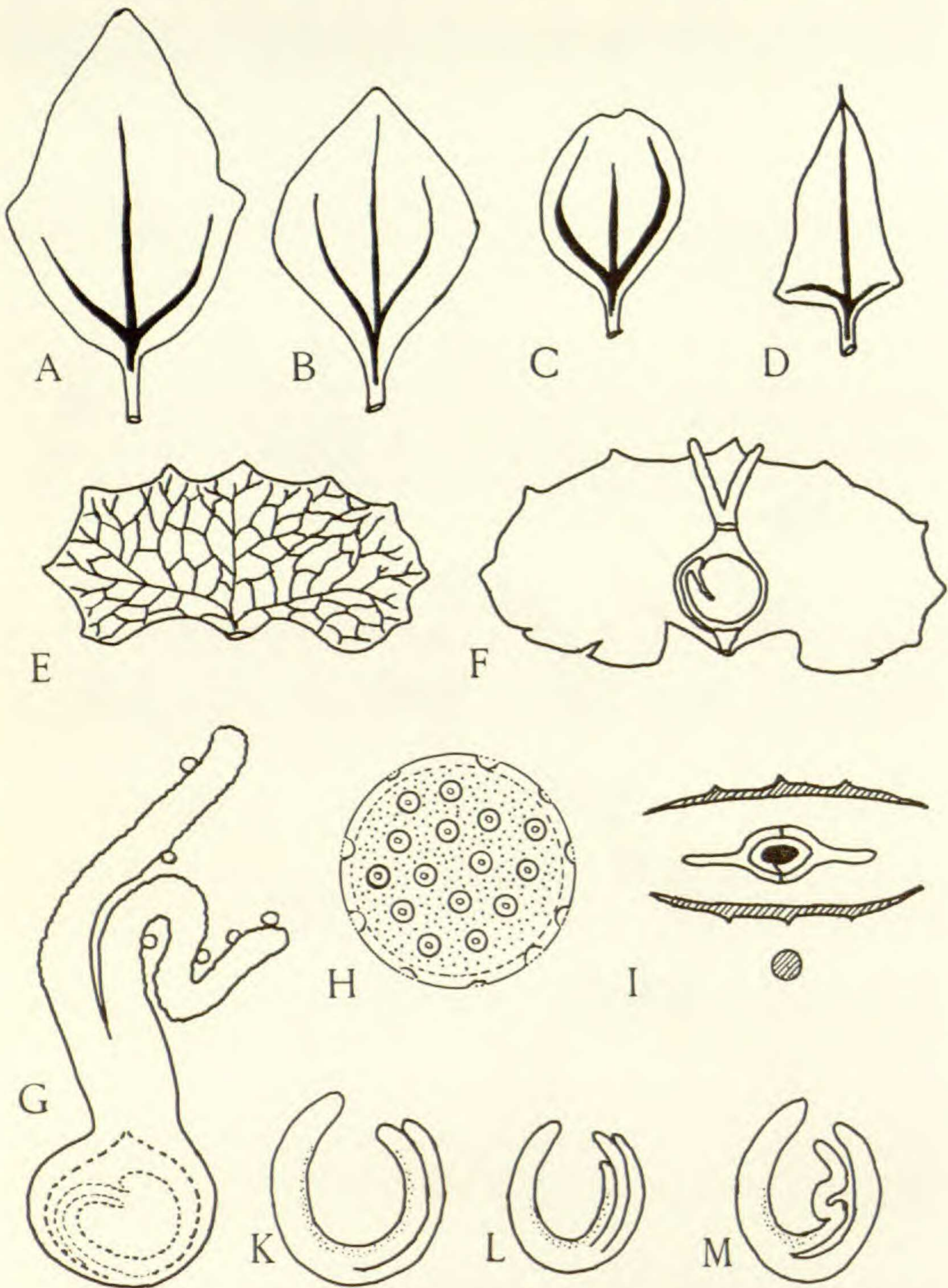


FIG. 2. *Atriplex asphaltitis* Kasapligil. A-C, variation in the lower leaves, $\times 3$; D, triangular upper leaf, $\times 3$; E, adaxial view of a prophyll (fruiting bract) showing the vascular reticulum, $\times 10$; F, prophyll attached to mature fruit [note protruding stigmas and upwardly pointed radicle], $\times 10$; G, pistil at time of pollination [dotted lines showing locule, campylotropous ovule and funiculus attached to ovary base], $\times 70$; H, spheroidal, polyporate pollen grain resembling golf ball [note \pm equally spaced pores and thick ectexine], $\times 1600$; I, ground plan of pistillate flower showing both prophylls and bicarpellate ovary; K-M, dissected embryos showing structural and size variation [note the presence of three cotyledons in L, and folded inner cotyledon in M], $\times 15$.

Dead Sea (= Lacus Asphaltites, hence the specific epithet), on dry calcareous salines, alt. ca. 390 m. below sea level, Dec. 8, 1954, *B. Kasapliligil 1656* (UC 1,083,535; photo. A). Arabic names: Kataf, Rughat.

In its native habitat *Atriplex asphaltitis* is associated with the following species, *Anabasis haussknechtii* Bunge, *Arthrocnemum glaucum* (Del.) Ung.-Sternb., *Suaeda* sp., *Statice pruinosa* L., *Phragmites communis* Trin. var. *stenophylla* Boiss., *Nitraria retusa* (Forsk.) Aschers., *Tamarix pentandra* Pall., *T. amplexicaulis* Ehrenb., and *T. jordanis* Boiss.

The new species, *Atriplex asphaltitis*, is a member of section FRUTICULOSAE Aellen (1940) and is related to *A. griffithii* Moq., which is indigenous to regions from the Persian deserts to Afghanistan. The compari-

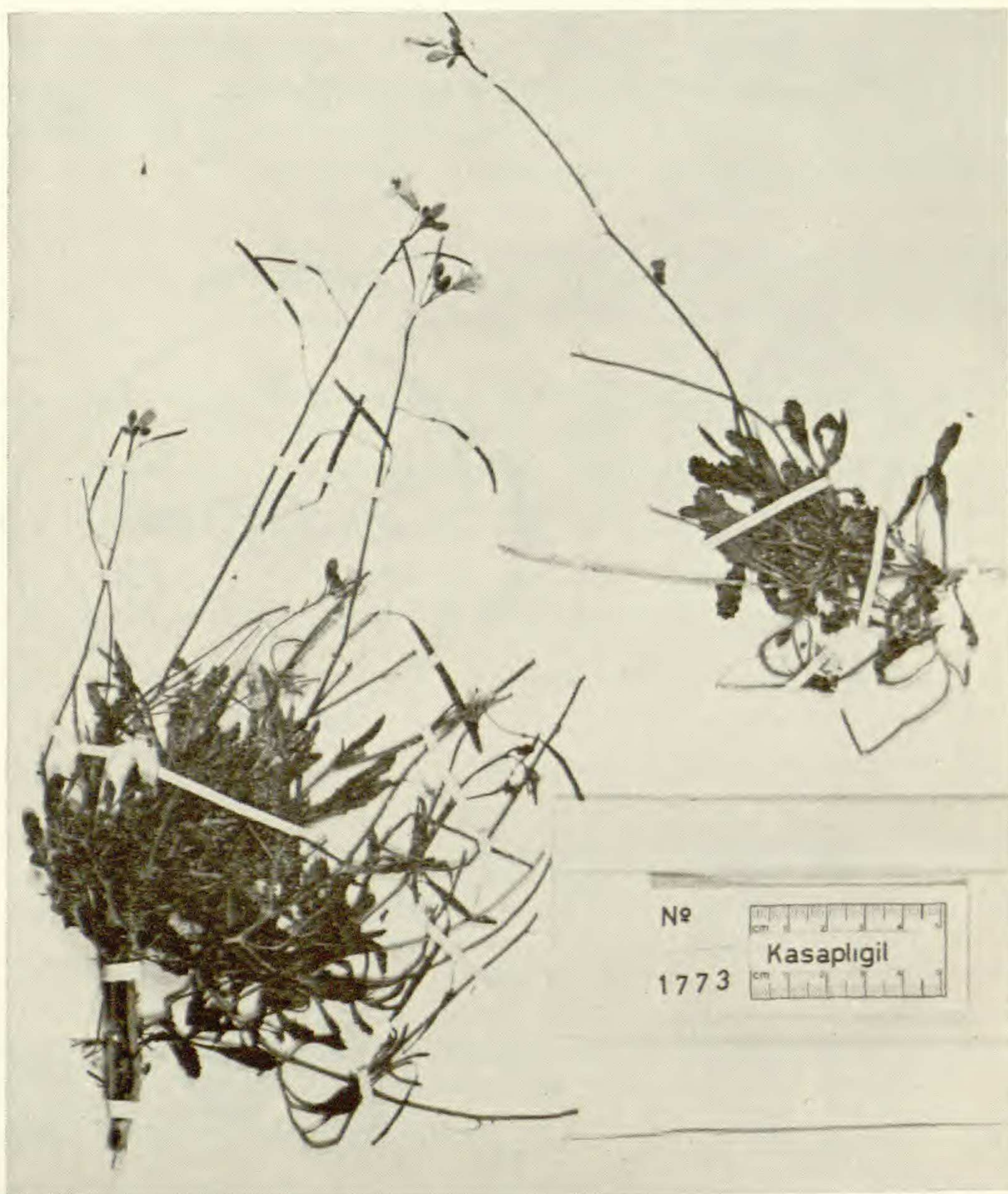


FIG. 3. *Diplotaxis kerakensis* Kasapliligil. Habit of fruiting plants [note profuse branching of stems at base].

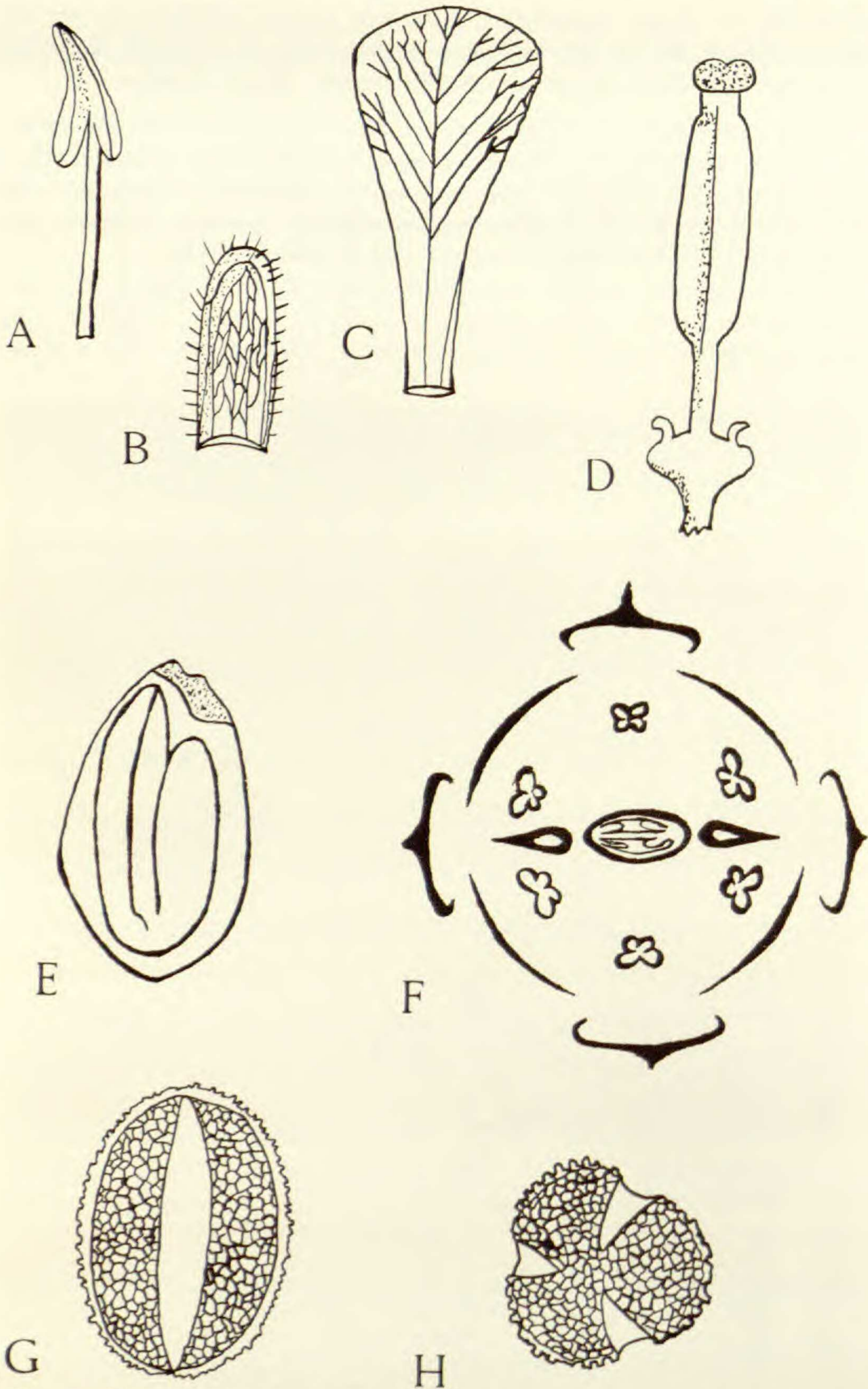


FIG. 4. *Diplotaxis kerakensis* Kasapliligil. A, stamen, $\times 8$; B, adaxial view of sepal with involute margins, $\times 5$; C, petal with single trace, $\times 5$; D, floral receptacle bearing pistil and horn-shaped nectaries, $\times 5$; E, longitudinal section of

son of characters of *A. asphaltitis* and *A. griffithii* is summarized in the table which follows.

	<i>Atriplex asphaltitis</i>	<i>Atriplex griffithii</i>
HABIT	Shrub, 1–1.5 m. high, white-glaucous.	Shrub, to 1 m. high, white-glaucous.
LOWER LEAVES	Alternate, entire or sparsely dentate, rhombic to broadly trullate or elliptic; acute or retuse at apex; cuneate or truncate at base; 1.5–2 cm. long, 1–1.5 cm. wide.	Opposite or alternate, entire, narrowly ovate; acuminate at apex, cuneate at base; 2.5 cm. long, 2 cm. wide.
UPPER LEAVES	Triangular, mucronate, the margins entire, but dentate at base.	Narrowly ovate, margins entire or sparsely dentate.
SEXUALITY	Dioecious.	Monoecious.
INFLORESCENCE	Glomerules loosely spicate, prominently interrupted, clusters 6–8 mm. thick.	Glomerules densely spicate, unisexual, clusters 10–11 mm. thick.
STIGMA	2 stigmas from a short style, slightly protruding from bracts at maturity, 1–1.5 mm. long.	2–3 stigmas from a longer style, completely hidden within bracts at maturity, ca. 1.5 mm. long.
FRUITING BRACTS	Depressed-ovate to reniform, auriculate at base, margins conspicuously dentate, firmly united at base and around fruit, vasculature conspicuous, appendages none, 4 mm. long, 7 mm. wide.	Roundish oval or triangular-cordate, rounded at base, margins obsolete denticulate, firmly united halfway, vasculature very prominent, appendages present, up to 11 mm. long, 9 mm. wide.
SEEDS	Light brown, 2–2.5 mm. in diameter.	Dark brown, 2–2.5 mm. in diameter.
EMBRYO	Cotyledons 2 or 3, radicle directed upwardly.	Cotyledons always 2, radicle directed laterally.
POLLEN	24.74 (21.12–29.92) microns in diameter, germ pores 60 (50–72).	22.31 (19.36–24.64) microns in diameter, germ pores 33 (24–44).

Unfortunately, staminate specimens of *Atriplex asphaltitis* were not available for study. The pollen grains described here were obtained from the stigmatic surfaces of the pistillate flowers. *A. asphaltitis* is remarkably distinct from *A. griffithii*. Its relationship to *A. halimus* L. which belongs to section CORIACEA Aellen is remote.

seed showing folded embryo [note that cotyledons are longer than the radicle], $\times 45$; F, ground plan of flower; G–H, equatorial and polar views of tricolpate pollen grains showing polygonally reticulate surface, $\times 1200$.

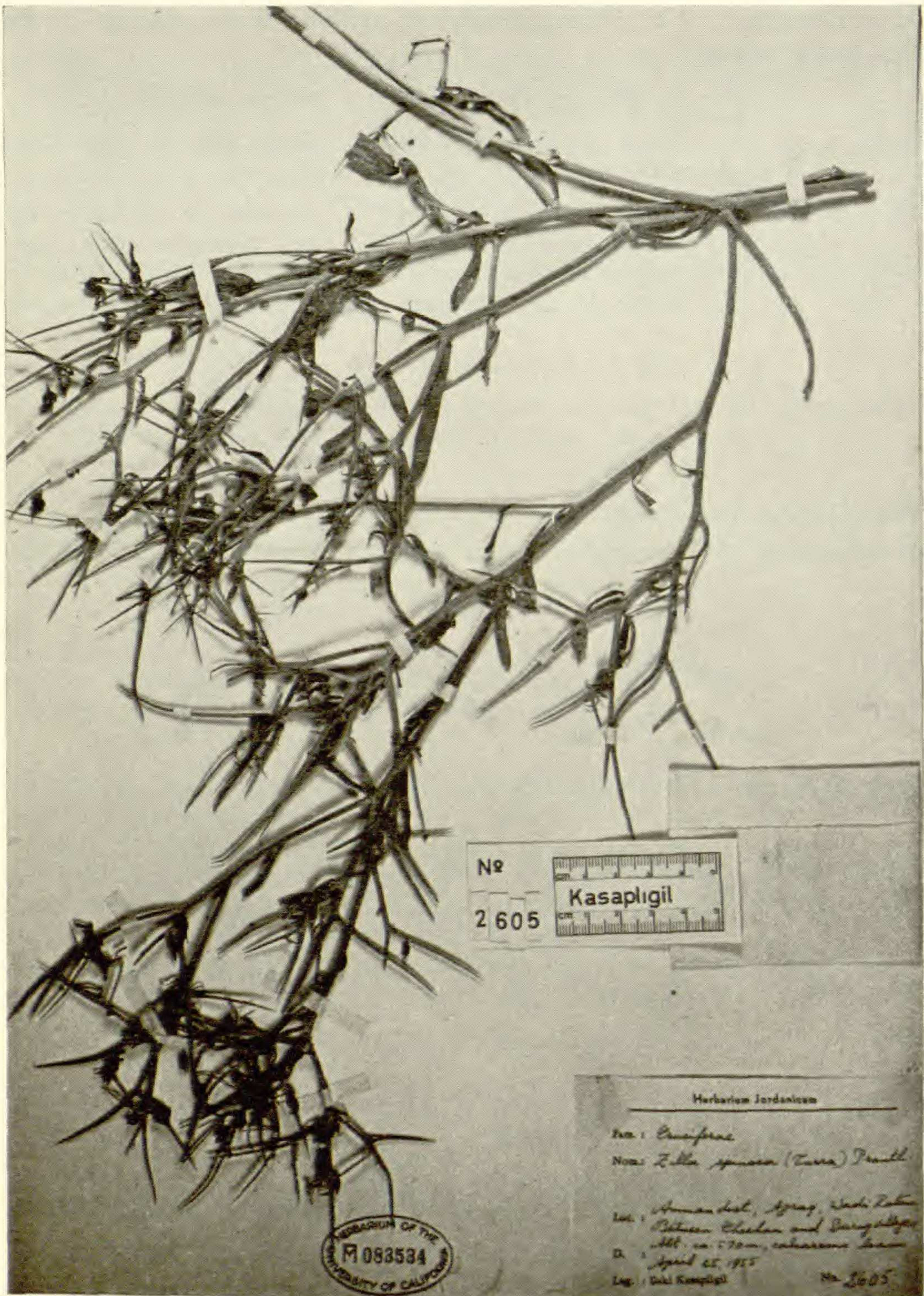


FIG. 5. *Zilla spinosa* (Turra) Prantl var. *emarginata* Kasapliligil. Portion of intricately branching stem.

Diploaxis kerakensis sp. nov.

FIGS. 3 and 4.

Planta basi lignescens, ramosa; pedicelli et flores aequilongi; petala intense lutea; antherae acumine cuspidatae; nectariae corniformes; cotyledones quam radicularae longiores; grana pollinis prolata vel subprolata,

tricolpata, exina 2.5 micra crassa, polygonali-reticulata, axis polaris 36.7 (33-40) micra longa, diameter aequatorialis 26.2 (24-28.5) micra longus.

Perennial herb 20-30 cm. high, branching only at the woody base, the lower parts of stems sparingly hairy, the upper parts glabrescent, rarely bearing leaves; leaves spatulate-oblongate, 2-4.5 cm. long, 0.5-1 cm. broad, glaucous, coarsely dentate, hispid; pedicels equaling flowers in length; sepals 6-7 mm. long, 1.5-2 mm. broad, ovate, the margins membranous, involute, the dorsal surface velutinous, with 3-5 vascular traces from base; petals spatulate, twice as long as sepals, bright yellow, with a single vascular trace from base; short stamens 7 mm. long, long stamens 9-9.5 mm. long, anthers 2-2.5 mm. long, pointed at tip, filaments without appendages, with a single trace from base; pistil 6-6.5 mm. long, 1 mm. broad on flat side, gynophore filiform, 2-2.5 mm. long, stigma obscurely bilobed, style very short; nectaries horn-shaped, 0.5 mm. long, persistent at fruiting stage; silique 3.5-4 cm. long, 2.5-3 mm. broad, erect-ascending when young, drooping at maturity; seeds 76-98 per silique, 1-1.5 mm. long, 0.75-1 mm. broad, oval, flat, the seed coat brownish yellow, the embryo folded, cotyledons longer than radicle; pollen grains prolate to subprolate, tricolpate, exine 2.5 microns thick, polygonal-reticulate, polar axis 36.7 (33-40.5) microns, equatorial diameter 26.2 (24-28.5) microns.

HOLOTYPE: Kerak district, Kerak, Castle of Crusaders, on walls, alt. ca. 1000 m. above sea level, Dec. 16, 1954, *B. Kasapligil 1773* (UC 1,083,543; isotype, A).

This new species of *Diploaxis*, *D. kerakensis*, is a member of section CATOCARPUM DC. (Syst. 2: 629. 1821; Prodr. 1: 221. 1824), in which the silique is characterized by having a filiform gynophore and 50-150 ovules. *D. kerakensis* is allied to *D. harra* (Forsk.) Boiss. (cf. Schulz in Engler, Pflanzenfam. 17b: 343. fig. 188 A, B. 1936), but it differs from that species as shown in the summary which follows.

	<i>Diploaxis kerakensis</i>	<i>Diploaxis harra</i>
HABIT	Stems branching at woody base.	Stems branching above.
FLOWER	Large, bright yellow.	Small, pale yellow.
PEDICEL	Equaling the flowers.	Longer than the flowers.
SEPALS	6-7 mm. long.	4-5 mm. long.
PETALS	12-13 mm. long.	7-9 mm. long.
ANTHERS	Pointed at tip.	Blunt at tip.
STIGMA	Capitate or slightly bilobed.	Distinctly bilobed.
NECTARIES	Horn shaped	Club shaped.
COTYLEDONS	Longer than radicle.	Shorter than radicle.

Zilla spinosa (Turra) Prantl var. *emarginata* var. nov.

FIGS. 5 and 6 A, B.

Folia 2-4.5 cm. longa, 3-14 mm. lata, lanceolata; spini graciles, usque

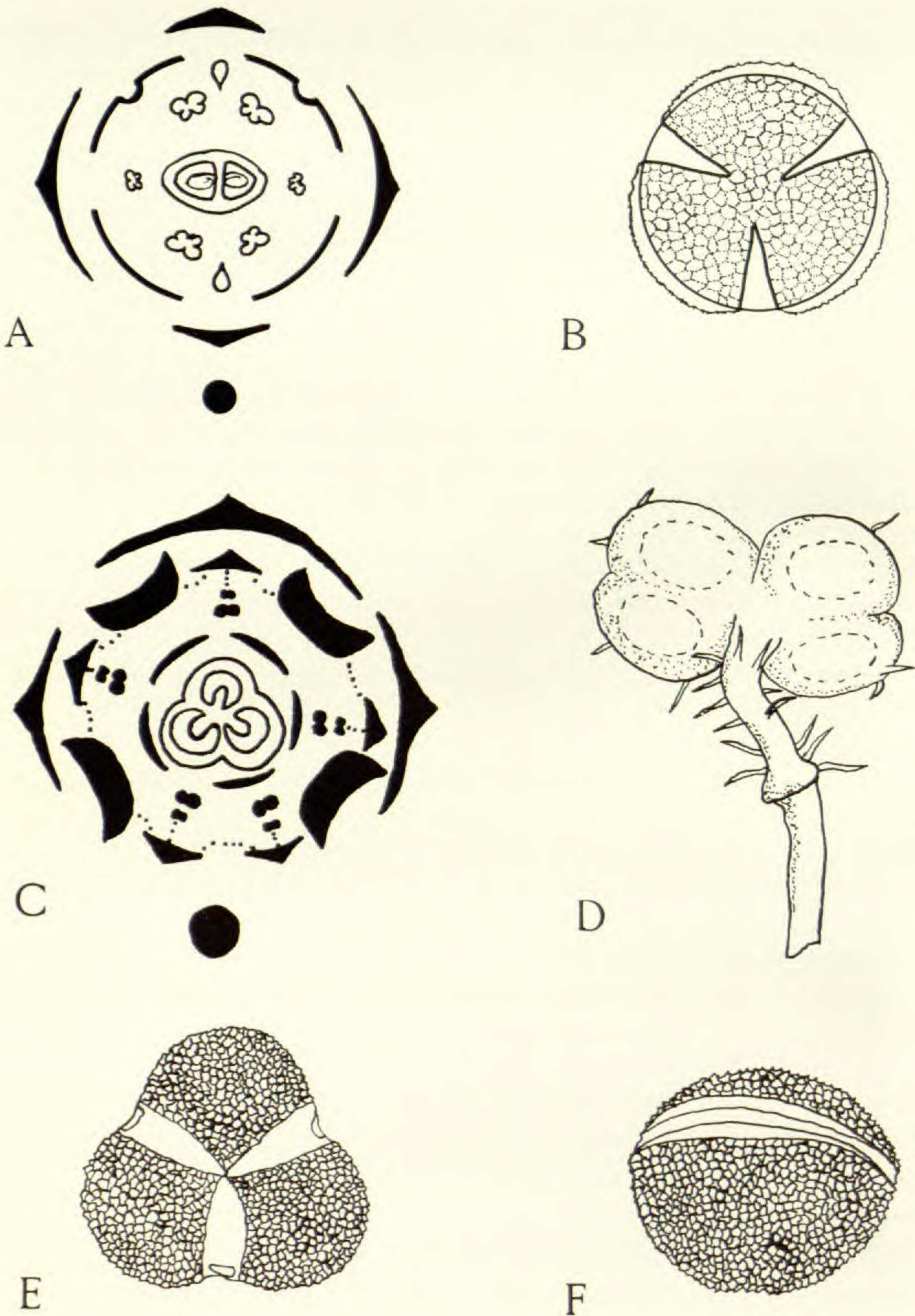


FIG. 6. A and B, *Zilla spinosa* (Turra) Prantl var. *emarginata* Kasapliligil. Ground plan of flower showing positions of emarginate petals and polar view of a pollen grain, $\times 1800$.

FIG. 6. C-F, *Euphorbia aleppica* L. var. *prostrata* Kasapliligil. C, Ground plan of cyathium showing three subtending bracts (outermost whorl), four crescent-shaped glands forming an involucre with five alternating prophylls, ten staminate flowers adnate to involucre, five residual perianth segments

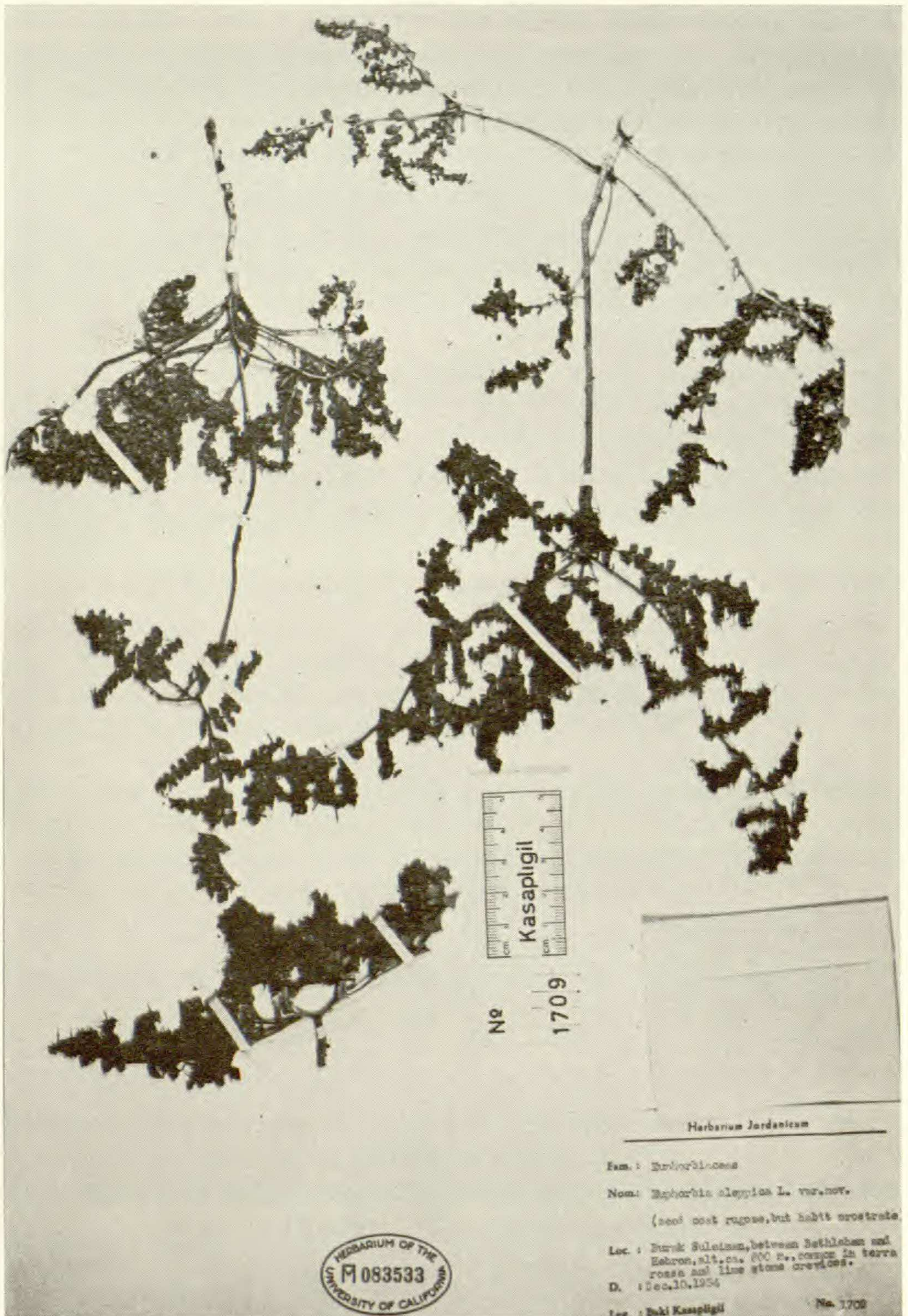


FIG. 7. *Euphorbia aleppica* L. var. *prostrata* Kasapliligil. Branching habit of plant.

adjacent to tricarpellate ovary of pistillate flower in center; D, staminate flower with a single anther and four microsporangia, $\times 76$; E, polar view of pollen grain showing three furrows and irregularly reticulate exine, $\times 1000$; F, equatorial view of a pollen grain, $\times 1000$.

ad 7 cm. longae; sepala interna 6–7 mm. longa, 1 mm. lata, lanceolata, sepala lateralia 7–8 mm. longa, 2–3 mm. lata, ovata; petala 16 mm. longa, lobi 3 mm. lati, petala dua externa apice emarginata; grana pollinis tricolpata, exina 3 micra crassa, superficies polygonali-reticulata, axis polaris 16.5–19.5 micra longa, diameter aequatorialis 22.5–24 micra longus.

HOLOTYPE: Amman district, eastern desert near Azraq, in Wadi Ratam (a branch of Wadi Sirhan) between Chechan and Druse (in Arabic "Duruz") villages, calcareous loam, alt. ca. 570 m. above sea level, Apr. 25, 1955, *B. Kasapligil 2605* (UC 1,083,534; isotype, A).

Zilla spinosa (Turra) Prantl is a variable species indeed. The specimens from Maan district of Jordan, Sinai peninsula, Egyptian deserts and Algeria which are deposited in the herbarium of the Royal Botanic Gardens, Kew, show considerable variation in the size of the floral appendages. However, all the specimens I examined from other localities had petals with rounded apices.

Euphorbia aleppica L. var. *prostrata* var. nov. FIGS. 6 C–F, 7.

Planta procumbens; folia inferiora 6–10 mm. longa, 0.5–1 mm. lata, linearia, mox decidua; folia superiora 2–8 mm. longa, 2–5 mm. lata, ovoideo-rhomboidea; grana pollinis tricolpata, exina irregulariter reticulata, axis polaris 42 (40–43) micra longa, diameter aequatorialis 37 (36–39) micra longus.

Plant procumbent; lower leaves 6–10 mm. long, 0.5–1 mm. broad, linear, readily deciduous; upper leaves 2–8 mm. long, 2–5 mm. broad, ovate-rhombic; pollen grains tricolpate, exine irregularly reticulate, polar axis 42 (40–43) microns long, equatorial diameter 37 (36–39) microns.

HOLOTYPE: Burak Suleiman, between Bethlehem and Hebron, common in terra rossa and limestone crevices, alt. ca. 800 m. above sea level, Dec. 10, 1954, *B. Kasapligil 1709* (UC 1,083,533; photo. A).

Other specimens examined: Syria, Hauran, Kneia, *E. Peyron 667* (G); Cyprus, Kyrenia, *E. W. Kennedy 612* (K).

Besides the procumbent habit, *Euphorbia aleppica* var. *prostrata* differs from *E. aleppica* var. *aleppica* with respect to the sizes of the lower as well as of the upper leaves on stems which are considerably larger in the latter. On the other hand, seed-coats are rugose in both varieties.

BIOLOGY DEPARTMENT
MILLS COLLEGE
OAKLAND, CALIFORNIA